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TOWNSHIP OF WHITCHURCH
1966
COUNTY OF YORK

THE
ONTARIO WATER RESOURCES
COMMISSION
WATER POLLUTION SURVEY
of the
TOWNSHIP OF WHITCHURCH
COUNTY OF YORK

1966

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Report on a water pollution
survey of the township of
Whitchurch, county of York.

80508

R E P O R T

on a

WATER POLLUTION SURVEY

of the

TOWNSHIP OF WHITCHURCH

County of York

April, 1966

The Division of Sanitary Engineering

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R E P O R T

THE ONTARIO WATER RESOURCES COMMISSION

INTRODUCTION

A water pollution survey was made of the Township of Whitchurch on October 27, 1965. The purpose of the survey was to locate and record all significant sources of water impairment within the township. Surveys of this nature are conducted routinely and upon request throughout the Province of Ontario by the Ontario Water Resources Commission as a basis for evaluating any existing or potential sources of pollution.

Recommendations are made pertaining to water pollution abatement and the Commission expects that corrective measures will be taken by those concerned.

The municipal and York County Health Unit officials provided very helpful information and assistance during this survey.

SUMMARY AND RECOMMENDATIONS

The water pollution survey made of the Township of Whitchurch revealed that in most instances, satisfactory protection was being provided the surface waters. There are no municipally-owned communal water or sewage works systems within the township. Municipal officials contemplating a marked increase in development have given consideration to establishing a communal water works system. Preliminary discussions have been held with the OWRC, but no definite action has been proposed.

Certain urbanized areas within the township will probably require communal sewage works systems as they become more densely populated. Consideration should be given to planning for these future requirements.

There are three areas in the township where refuse is taken for disposal. These sites do not appear to present a ground or surface-water impairment problem.

Industrial pollution is not a serious factor at this stage in the development of the township. One industry, King Cole Ducks Limited has encountered difficulty in achieving satisfactory waste disposal, but the company has taken action to eliminate this water impairment problem. The company should continue its efforts to abate water pollution.

The private water works owned by Carl Herman and supplying water to a number of homes in the Lake Wilcocks area requires closer supervision in the operation and maintenance of the system.

RECOMMENDATIONS

1. Municipal authorities should continue to provide adequate protection for waters within the Township of Whitchurch by planning for future development.
2. King Cole Ducks Limited should continue its efforts in abating water pollution.
3. Closer supervision is required in the operation and maintenance of the Carl Herman Water Works system.

I GENERAL

The 1965 assessed population of the Township of Whitchurch according to the Ontario Department of Municipal Affairs 1966 Municipal Directory was 7,448. The township is bordered on the south by the Township of Markham, on the west by Highway No. 11, on the east by the York County line, and on the north by the Township of East Gwillimbury.

The community of Oak Ridges and Vandorf Station and the Lake Wilcocks, Musselman Lake areas contain the highest densities of population. Small subdivision type settlements have been developed in various sections of the township. However, aside from these urban areas the municipality remains mainly rural.

The following information presented regarding the top soil resources of the township was gained from the Soil Survey of York County Report No. 19 of the Ontario Soil Survey prepared by the Experimental Farms Service, Canada Department of Agriculture and the Ontario Agricultural College.

Pontypool sand, Brighton sandy loam, Woburn loam, Schomberg clay loam, Percy fine sandy loam, Cashel clay and Milliken loam are the main types of top soil that occur in the Township of Whitchurch.

Pontypool Sand - The materials on which the soils of this group are developed, were deposited by glacio-fluvial action. These materials occur in broad areas in the township and consist mainly of sand with pockets of gravel and till also present. The materials

are calcareous. Pontypool sand is well drained to excessively drained soil on irregular steeply sloping topography.

Brighton Sandy loam is formed on coarse sandy outwash material and has smooth gently sloping topography. It is a Grey-Brown Podzolic soil. In spite of the smooth gently sloping topography, Brighton sandy loam is well drained because the porosity of the materials facilitates the rapid percolation of moisture.

Woburn loam and Milliken loam - These are two members of the Woburn catena and the materials are dominantly shale with varying amounts of limestone present. Woburn loam occurs on smooth moderately sloping topography. It is classified as a Grey-Brown Podzolic soil. Although the topography of the Woburn loam is usually moderately sloping, steep slopes occur in some localities. The type is susceptible to sheet erosion and has suffered noticeably where slopes are steep. Both external and internal drainage is good. Milliken loam is imperfectly to moderately well drained. The topography ranges from smooth gently sloping to smooth moderately sloping. Little erosion occurs on this type except where moderate slopes cause rapid runoff. Both external and internal drainage is moderately good.

Schomberg clay loam - The Schomberg catena has developed on very pale brown clays and silts. The lacustrine deposits consist of alternate layers of calcareous silt and clay. The topography is smooth moderately sloping and the soil is susceptible to sheet erosion. Internal drainage is slow and external drainage is high.

Percy fine sandy loam - Developed on high lime fine sand, Percy fine sandy loam occurs in fairly large tracts in the Township of Whitchurch. It is a Grey-Brown Podzolic soil. The topography is smooth gently sloping to moderately sloping, and the type is moderately susceptible to sheet erosion. The Percy series is well drained.

Cashel Clay - The Cashel catena has developed on the high lime lacustrine clays underlain by heavy textured clay till. Smooth moderately sloping topography and good drainage are characteristic of the Cashel clay type. The solum is stonefree but usually contains small bits of shale. The internal drainage is slow but there is sufficient fall towards the stream courses to permit adequate external drainage. The type has suffered from sheet erosion to some extent and gully erosion may require control measures, particularly along stream courses.

Surface watercourses providing drainage for the township are the tributaries of the Don and Rouge rivers, Duffin Creek and the Holland and Black rivers. The southern half of the municipality drains to Lake Ontario while the northern half drains to Lake Simcoe.

Economically the township residents are dependent on small industries, businesses and farming.

II WATER USES

(1) Municipal Water Supply

A number of township residents in the Lake Wilcocks area are serviced with water. The water is purchased by the Township of

Whitchurch from the Township of King, Community of Oak Ridges water works system. The well water is softened and treated for the removal of iron at the source. Aside from this supply and another private water works system, the remainder of the municipality depends on private individual water supplies.

Municipal officials contemplate increased development in the near future due to the proximity of the township to Metro and also the proposed construction of Highway No. 404. To present conditions acceptable to large subdivision type developments the township has given consideration to establishing a municipal water supply. There are a number of proposals under consideration but no definite action has been taken.

(2) Private Water System

There is one private works in the township. The Carl Herman Water Works is inspected routinely by the OWRC. Water is taken from Lake Wilcocks, chlorinated and discharged to an underground reservoir. The water rises through a filter bed of limestone and charcoal and is pumped to a pressure tank and then to the distribution system.

The bacteriological quality of the raw water is such, that chlorination for disinfection purposes needs to be applied to the water. The chlorination procedure at this water works should be carefully supervised and a minimum chlorine residual of 0.5 ppm should be maintained in the water leaving the pumphouse.

(3) Industrial Water Supply

King Cole Ducks Limited, is a poultry processing plant, and is located north of the Aurora Side Road on Lot 21, Concession 5, in the Township of Whitchurch. Ducks are raised and killed at this farm.

Water is obtained from Bogart Creek. The water is pumped to a fresh storage pond and then to the farm when required. Reportedly, the pond's storage capacity is sufficient to make it unnecessary to pump from the creek during periods of low flow.

Water for two private homes and the processing plant is chlorinated before being used.

(4) Recreational Uses

Considerable recreational use is made of Lake Wilcocks and Musselman Lake. Summer and permanent type residences have been constructed creating urbanized areas around these lakes. Water sports of all sorts can be enjoyed at these lakes. To a lesser extent the other waters of the township are used for recreational purposes as well.

To insure the continuance of this very enjoyable use of these waters every effort should be made to protect the water quality from impairment.

(5) Agricultural Uses

Equally important as the recreational uses of these waters are the agricultural uses. The watercourses provide a source of

water supply and drainage of the land. Caution should be exercised by the people engaged in farming in the township to insure that the water quality of these waters is not impaired by the discharge of agricultural wastes to the streams.

III WATER POLLUTION

(1) Sanitary Waste Disposal

Sanitary wastes are disposed of by means of private individual sewage disposal systems. These systems in most instances take the form of a septic tank and subsurface tile bed. The York County Health Unit is responsible for supervising the location and installation of these systems. Reportedly, very few operating problems have been encountered with the systems installed under the health unit's supervision.

There appears to be no difficulty in achieving satisfactory disposal of sanitary wastes employing existing methods. However, with the continued urbanization of certain areas within the municipal unit, consideration should be given to providing communal sewage disposal systems for the areas affected.

(2) Refuse Disposal

(a) York Sanitation Company Limited - Refuse domestic in nature is collected by this company from the Oak Ridges, Lake Wilcocks area for disposal at the company's refuse disposal site on Lot 13, Concession 2, in the Township of Whitchurch. Industrial wastes from the Collis Leather Company Limited in Aurora are

disposed of at this site. Sanitary landfill methods are employed as domestic refuse is dumped on the ground surface, the liquid industrial wastes are sprayed on the surface of the refuse and then a cover of soil is applied.

There has been some concern expressed by residents of the municipality living near the site over the possibility of ground water pollution. The Commission instituted a programme during the year 1960 to maintain a check on the ground-water quality. The procedure followed was to collect samples from private wells and ponds in the immediate area upstream and downstream from the site. To gain information regarding the quality of the ground water more immediately downstream from the site the Commission asked the Collis Leather Company Limited to drill two test wells. These wells were drilled in 1964 at locations deemed pertinent by the Division of Water Resources, Ontario Water Resources Commission.

Samples collected on a routine basis from these wells are submitted to the OWRC Laboratory for chemical analyses. An analysis of the accumulated data does not reveal any significant impairment of the quality of the ground water. The Commission is continuing this ground-water quality observation programme.

Another problem associated with the operation of this sanitary landfill is that when the liquid industrial wastes are sprayed on the surface of the refuse, runoff of the wastes occurs.

An effort has been made to control this runoff of wastes by trapping it in artificially created pits. Careful supervision is required to adequately control this problem.

(b) Pellet's Refuse Disposal Area - Mr.O. Pellet operates a refuse collection service for the residents of the Musselman Lake area. The refuse is disposed of at a site located on the West half of Lot 14, Concession 8 in the Township of Whitchurch. This refuse disposal area appears to be so located, that adequate protection is provided the surface waters.

(c) Central Sanitary Landfill - This sanitary landfill area is located in Lot 11, Concession 2 in the Township of Whitchurch and is owned by Mr.H. Tough and managed by Mr.G.A. White. Refuse consisting mainly of building rubble, including wood, plaster, broken concrete, etc., is dumped into a low lying marshy area, where it is sorted. The metal is removed and combustible material incinerated. The ash is then levelled and covered with a layer of earth.

Surface drainage from the site lies toward the northwest of one of the upper reaches of the Holland River. It appears that adequate protection is provided for surface waters, however, routine inspections will be made by the OWRC to ensure that this condition is maintained.

(3) Industrial Waste Disposal

King_Cole Ducks Limited - As previously discussed, this industry is a poultry processing plant. Ducks are raised and killed

at this farm. Wastewater from the farm is disposed of by means of a series of settling ponds, a waste stabilization pond and a spray irrigation system. Normal operating procedure includes the collection of the wastewater for final disposal through the spray irrigation system on the ground surface. During the winter months the wastewater is directed to the settling ponds and lagoon for storage and subsequent final disposal during the summer months through the spray irrigation system.

This method of waste disposal appears to be operating satisfactorily. The settling ponds and lagoon provide adequate storage capacity for the industry's present waste flow and the spray irrigation system operates effectively. The area of the field which receives the sprayed wastes was estimated at four to five acres. The method employed in spraying the wastes on the field, allows for the resting of sections of the field while the remainder is being dosed. This procedure is designed to prevent saturating the soil and causing surface runoff of the wastes.

A pond has been constructed on the south-west corner of the property as a reservoir for the storage of water. Water from the reservoir is pumped to a series of duck ponds located on the north-west corner of the property. The water from the duck ponds is collected in a wet well and pumped to the waste disposal system. At the time of the OWRC inspection on October 27, 1965 an effluent was being discharged from the reservoir. This reservoir effluent leaves

the King Cole Ducks Limited property and flows north-west to its confluence with Bogart Creek. Samples were collected from the effluent at the reservoir and at the road allowance between Concessions 4 and 5 for chemical analyses and bacteriological examination. The 5-Day BOD and suspended solids of the effluent were in excess of the Commission's maximum objective of not greater than 15 ppm. In addition the effluent was of poor bacteriological quality.

The cause of the poor quality of this reservoir effluent could be attributed to the solid wastes deposited in the water by the ducks and the surface runoff of solid wastes on the ground surface in the yard. These wastes could deteriorate the water quality. Mr. J. Murby, President of King Cole Ducks Limited, reported that ordinarily there would be no effluent discharged from the pond. The effluent discharge on October 27, 1965 was reportedly caused by the failure of one of the pumps to operate.

King Cole Ducks Limited should take the action necessary to eliminate the discharge of the poor quality reservoir effluent to Bogart Creek.

IV DISCUSSION OF LABORATORY RESULTS

The surface waters in the Township of Whitchurch generally exhibit satisfactory quality both bacteriological and chemical, except for the Holland River. The 5-Day BOD and coliform concentrations in this stream are deteriorated, by the discharge of treated wastes from the Town of Aurora Water Pollution Control Plant. Aurora

is giving consideration to the provision of more adequate treatment facilities.

The Commission is presently conducting a ground-water quality observation programme at a sanitary landfill site in Lot No. 13, Concession 2. An analysis of the data collected to date shows that no significant deterioration of the ground water has occurred.

The Township of Whitchurch should endeavour, by planning for future expansion, to control water pollution and prevent impairment of these waters.

V CONCLUSIONS

A water pollution survey of the Township of Whitchurch has revealed that within the township there is a satisfactory degree of protection being provided the surface waters. Consideration should be given to planning for future expansion in the township, thereby providing protection for these waters.

The top soil formations in the township appear to provide in most instances, suitable soil conditions for the absorption of sewage, thereby allowing development with private individual non-effluent producing sewage disposal systems. The York County Health Unit officials reported that the septic tank and subsurface tile bed systems installed under their supervision are operating satisfactorily.

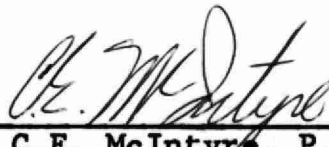
There is not a municipally owned water works system in the Township of Whitchurch. However, some consideration has been given

by the municipal officials to developing a municipal system. One private water works system owned by Carl Herman is inspected routinely by this Commission. The chlorination procedure at this water works should be more carefully supervised and a minimum chlorine residual of 0.5 ppm should be maintained at all times in the water leaving the pumphouse. One industry, King Cole Ducks Limited takes water from Bogart Creek for industrial use. The provision of a reservoir at this farm appears to have eliminated the problems caused by taking water from the creek at times of extremely low flows.

The township officials should continue and expand the present water impairment prevention practices.

/elb

Approved by



C.E. McIntyre, P.Eng.,
District Engineer,
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Prepared by: D.A. Murray Wilson,
Engineer's Assistant.

APPENDIX

GLOSSARY OF TERMS

Bacteriological Examinations - The Membrane Filter technique is used to obtain a direct enumeration of coliform organisms. These organisms are the normal inhabitants of the intestines of man and other warm-blooded animals. They are always present in large numbers in sewage and are, in general, relatively few in number in other stream pollutants. The results are reported as M.F. coliform count per 100 millilitres.

Biochemical Oxygen Demand (BOD) - The BOD test indicates the amount of oxygen required for stabilization of the decomposable organic matter found in the sewage, sewage effluent, polluted waters or industrial wastes by aerobic biochemical action. The time and temperature used are 5 days and 20°C respectively.

Solids - The analyses for solids include tests for total, suspended and dissolved solids. The former measures both the solids in solution and in suspension. Suspended solids indicate the measure of undissolved solids of organic or inorganic nature, whereas the dissolved solids are a measure of those solids in solution.

Turbidity - Turbidity is a measure of the fine suspended solids in water such as silt and finely divided organic matter. Where suspended solids values approach 20 parts per million or less, the results are usually reported as turbidity in silica units.

WATER QUALITY AND EFFLUENT OBJECTIVES

The desirable objectives for all surface waters in the Province of Ontario are as follows:

5-Day BOD	- not greater than 4 ppm
M.F. Coliform Count Median Value	- not greater than 2,400 per 100 ml
Phenolic Equivalents - average	- not greater than 2 ppb
- maximum	- not greater than 5 ppb
pH Range	- 6.7 to 8.5

A few pertinent maximum concentration limits of contaminants in storm sewers, sewage treatment plant and industrial waste effluents are listed on the following page. It is noted that adequate protection for surface waters, except in certain specific instances influenced by local conditions, should be provided if the

following concentrations and pH range are not exceeded.

5-Day BOD	- not greater than 15 ppm
Suspended Solids	- not greater than 15 ppm
Phenolic Equivalents	- not greater than 20 ppb
Ether Solubles (oil)	- not greater than 15 ppm
pH Range	- 5.5 to 10.6

LABORATORY RESULTS

STREAMS AND OUTFALLS

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>Turbidity in Silica Units</u>	<u>M.F. Coliform Count/100 ML</u>
HO-19.3	Aurora Cr.at Yonge St.½ mile north of Wellington St.	Aug.10/60	12.0	676	32	644		310,000
		Sept.7/60	11.0	676	-	-	11	4,300
		Sept.6/61	7.0	692	-	-	9	700
		June 14/62	15.0	1034	-	-	27	800
		Apr. 5/63	18.0	568	39	529		79,000
		July 2/63	47.0	780	-	-	65.0	
		July 31/63	25.0	672	157	415		89,000
		Nov.28/63	39.0	648	33	615		
		Nov.18/64	26.0	1006	51	955		29,000
		Oct.13/65	28.0	838	35	803		480,000
HO-17.3	Holland R.at sideroad one mile north of Aurora.	Aug.10/60	3.8	250	14	236		770
		Sept.7/60	2.0	274	-	-	12	650
		Sept.6/61	1.6	364	-	-	21	3,600
		June 14/62	1.7	326	-	-	11.0	2,070
		July 2/63	2.4	314	-	-	21.0	
		July 30/63	1.6	284	14	270		1,900
		Nov.18/64	1.8	371	15	356		360
		Oct.13/65	1.4	331	7	338		240
HOAM-16.6	Armitage Cr.at road allowance between Concs.1 and 2 north of Aurora.	Aug.10/60	2.0	264	16	248		90
		Sept.7/60	1.7	254	18	236		250
		Sept.6/61	2.4	398	-	-	21	1,100
		Nov.18/64	2.0	334	11	323		550
		Oct.13/65	Flow Insufficient For Sampling.					

LABORATORY RESULTS (CONT'D)

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>Turbidity in Silica Units</u>	<u>M.F. Coliform Count/100 ML</u>
HO-15.4	Holland R. at Armitage Sideroad (Mulock Dr.) east of Yonge St.	Aug.10/60	8.8	466	8	458		13,000
		Sept.7/60	11.0	336	-	-	9	270
		Sept.6/61	4.0	470	-	-	18	2,000
		June 14/62	4.8	558	-	-	6.5	7,900
		Apr. 5/63	2.6	388	28	360		35,000
		July 2/63	6.5	510	-	-	4.0	
		July 30/63	4.9	396	6	390		1,900
		Nov.18/64	4.1	660	7	653		360
		Oct.13/65	1.6	500	3	497		670
HOBT-20.3	Water from pond on King Cole Ducks Ltd.property at Conc.5 just north of Aurora Sideroad.	Feb.12/63	23	386	13	373		12,900
		Oct.27/65	11	492	30	462		171,000
HOBT-20.3 I	King Cole Ducks Ltd. pond effluent.	Oct.27/65	26	578	70	508		2,400,000